Data Validation SOP

HW-24, Rev. 1

Volatile Organics

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STANDARD OPERATING PROCEDURE FOR THE VALIDATION OF ORGANIC DATA ACQUIRED USING SW-846 METHOD 8260B (Rev 2, Dec 1996)

VOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS) : CAPILLARY COLUMN TECHNIQUE

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INTRODUCTION

Scope and Applicability

This SOP offers detailed guidance in evaluating laboratory data generated according to the USEPA SW-846, Method 8260B. The validation methods and actions discussed in this document are based on the requirements set forth in USEPA SW-846, Chapter Two, Rev 3, December 1996; Method 8000B, Rev 2, December 1996; Method 8260B, Rev 2, December 1996; and "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," February, 1994. This document covers technical as well as method specific problems; however situations may arise where data limitations must be assessed based on the reviewer's own professional judgement.

Summary

To ensure a thorough evaluation of each result in a data case, the reviewer must complete the checklist within this SOP, answering specific questions while performing the prescribed "ACTIONS" in each section. Qualifiers (or flags) are applied to questionable or unusable results as instructed. The data qualifiers discussed in this document are defined on page 25.

The reviewer must prepare a detailed data assessment to be submitted along with the complete SOP checklist. The Data Assessment must list all data qualifications, reasons for qualifications, instances of missing data, and contract non-compliance.

	YES	NO	N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER:____________________ LAB:____________________

SITE NAME:____

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? [ ] ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, signed release, or cover letter present? [ ] ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? [ ] ___ ___

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, Chain of Custodies, or signed releases from the field samplers present for all samples? [ ] ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? [ ] ___ ___

1.3 Sample Conditions/Problems

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ [ ] ___

YES NO N/A

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ___ [ ] ___

The holding time for aqueous samples is 14 days.

The holding time for soils is 10 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. If uncertain about preservation, contact the laboratory/sampling team to determine whether or not samples were preserved.

ACTION: If holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon reanalysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that

YES NO N/A

non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water [ ] ___ ___

b. Soil [ ] ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water [ ] ___ ___

b. Soil [ ] ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data Assessments and contact the laboratory/project officer/appropriate official for an explanation/resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were outliers marked correctly with an asterisk? [ ] ___ ___

ACTION: Circle all outliers with a red pencil.

3.4 Were one or more volatile surrogate recoveries out of specification for any sample or method blank (Surrogate recovery is 80-120% for aqueous and 70-130% for soil/sediment samples)? ___ [ ] ___

NOTE: Laboratory may use in-house performance criteria (as per SW-846, 8000B-43, Sect. 8.6 & 8.7).

If yes, were samples reanalyzed? [ ] ___ ___

Were method blanks reanalyzed? [ ] ___ ___

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

YES NO N/A

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

3.5 Are there any transcription/calculation errors between raw data and reported data? ___ [ ] ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Samples/Matrix Spikes (CLP Form III Equivalent)

4.1 Have the volatile Laboratory Control Samples (LCS) recoveries been listed on the laboratory reporting form? [ ] ___ ___

NOTE: If the data has not been reported, then contact the laboratory/project officer to obtain the information necessary to evaluate the spike recoveries in the MS, MSD, and LCS. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

YES NO N/A

NOTE: The LCS spike is spiked with the same analytes at the same concentrations as the matrix spike (as per SW-846, 8000B-40, Sect. 8.5) if different, make note in Data Assessment.

4.2 Were Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

a. Water [ ] ___ ___

b. Soil [ ] ___ ___

c. Med Soil [ ] ___ ___

ACTION: If any LCS data are missing, take the action specified in section 3.2 above.

4.3 How many LCS volatile spike recoveries are outside QC limits?

Water	Soil
___ out of ___	___ out of ___

ACTION: Circle all outliers with a red pencil.

4.4 Were one or more of the volatile LCS recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000B-41, Sect. 8.5.4. ___ [ ] ___

ACTION:
1. If the recovery is > upper in-house limit (or 130%), only positive values for the affected compound(s) are flagged "J".
2. If the recovery is < lower in-house limit (or 70%), flag positive values for the affected compound(s) "J" and non-detects "R".

All analytes in associated sample results are qualified for the following criteria.

1. If 25% of the LCS recoveries were < lower in-house limit (or 70%) qualify all positive results "J" and all non-detects "R".
2. If two or more LCS recoveries were < 10% qualify all positive results "J" and all non-detects "R".

		YES	NO	N/A
4.5	Have the volatile Matrix Spike(MS)/Matrix Spike Duplicate (MSD) recoveries been listed on the laboratory reporting form?	[ ]	___	___
4.6	Were matrix spikes analyzed at the required frequency for each of the following matrices:			
	a. Water	[ ]	___	___
	b. Soil	[ ]	___	___
	c. Med Soil	[ ]	___	___

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, 8260B-25, Sect. 8.4.2)

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.

4.7 How many MS/MSD volatile spike recoveries are outside QC limits?

Water	Soil
_____ out of _____	_____ out of _____

4.8 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Soil
_____ out of _____	_____ out of _____

ACTION: Circle all outliers with a red pencil.

		YES	NO	N/A
4.9	Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000B-41, Sect. 8.5.4.	___	[ ]	___

YES NO N/A

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

NOTE: MS/MSD criteria apply only to the original sample, its dilutions, and the associated MS/MSD samples.

1. If the recovery is > upper in-house limit/130%, only positive values for the affected compound(s) are flagged "J".
2. If the recovery is < lower in-house limit/70%, flag positive values for the affected compound(s) "J" and non-detects "UJ".
3. If two or more MS/MSD recoveries were < 10% qualify all positive results "J" and all non-detects "R".

5.0 Blank (CLP Form IV Equivalent)

5.1 Is the Method Blank Summary form present? [ ] ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported for samples of similar matrix, or concentration level, and for each extraction batch? [ ] ___ ___

5.3 Has a method blank been analyzed for each GC/MS system used ? [ ] ___ ___

ACTION: If any method blank data are missing, take action as specified in section 3.2. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.

Is the chromatographic performance (baseline stability) for each instrument acceptable for the volatiles? [ ] ___ ___

ACTION: Use professional judgement to determine the effect on the data.

	YES	NO	N/A
6.0 Contamination			
NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.			
6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.	[ ]	___	___
6.2 Do any trip/field/rinse/ blanks have positive results for target analytes and/or TICs?	___	[ ]	___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (May attach a separate sheet.)

NOTE: All field blank results associated with a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

YES NO N/A

	Sample conc > CRQL but < 10x blank value	Sample conc < CRQL & <10x blank value	Sample conc > CRQL & >10x blank
Methylene Chloride Acetone Toluene 2-Butanone	Flag sample result with a "U"	Report CRQL & qualify "U"	No qualification is needed

	Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL value & > 5x blank
Other contam-inants	Flag sample result with a "U"	Report CRQL & qualify "U"	No qualification is needed

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: The reporting of TIC compounds may or may not be required.

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R" unusable.

6.3 Are there trip/field/rinse/equipment blanks associated with every sample? [ ] ___ ___

ACTION: For low level samples, note in Data Assessment that there is no associated trip/field/rinse/equipment blank. For analytes with high concentrations, use professional judgement on qualification of these values and make note in Data Assessment. Exception: samples taken from a drinking water tap do not have associated field blanks.

YES NO N/A

7.0 GC/MS Apparatus and Materials

7.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. For the analysis of volatiles, the method requires requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2) [ ] ___ ___

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

8.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? [ ] ___ ___

8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? [ ] ___ ___

8.3 Has an instrument performance check solution (BFB) been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) [ ] ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS

ACTION: If the laboratory/project officer/appropriate official cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

	YES	NO	N/A
ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".			
8.4 Have the ion abundances been normalized to m/z 95?	[ ]	___	___
8.5 Have the ion abundance criteria been met for each instrument used?	[ ]	___	___
ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).			
ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.			
8.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.)	___	[ ]	___
8.7 Have the appropriate number of significant figures (two) been reported?	[ ]	___	___
ACTION: If large errors exist, take action as specified in section 3.2.			
8.8 Are the spectra of the mass calibration compound acceptable?	[ ]	___	___
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			

9.0 <u>Target Analytes (CLP Form I Equivalent)</u>

	YES	NO	N/A
9.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	[ ]	___	___
b. Matrix spikes and matrix spike duplicates	[ ]	___	___
c. Blanks	[ ]	___	___
d. Laboratory Control Samples	[ ]	___	___

		YES	NO	N/A
9.2	Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
	a. Samples and/or fractions as appropriate	[ ]	___	___
	b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	[ ]	___	___
	c. Blanks	[ ]	___	___
	d. Laboratory Control Samples	[ ]	___	___
ACTION:	If any data are missing, take action specified in 3.2 above.			
9.3	Are the response factors shown in the Quant Report?	[ ]	___	___
9.4	Is chromatographic performance acceptable with respect to:			
	Baseline stability?	[ ]	___	___
	Resolution?	[ ]	___	___
	Peak shape?	[ ]	___	___
	Full-scale graph (attenuation)?	[ ]	___	___
	Other:_____	[ ]	___	___
ACTION:	Use professional judgement to determine the acceptability of the data.			
9.5	Are the lab-generated standard mass spectra of identified volatile compounds present for each sample?	[ ]	___	___
ACTION:	If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, reject all positive data.			
9.6	Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[ ]	___	___

YES NO N/A

9.7 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?

9.8 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? [ ] ___ ___

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be positively ident- ified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

10.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

10.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ___

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ___

b. Blanks [ ] ___ ___

YES NO N/A

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 6.2 above.

10.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? ___ [ ] ___

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ___

10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ___

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2 (M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

11.0 Compound Quantitation and Reported Detection Limits

11.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? ___ [ ] ___

YES NO N/A

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

11.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? [ ] ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

12.0 <u>Standards Data (GC/MS)</u>

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? [ ] ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

13.0 <u>GC/MS Initial Calibration (CLP Form VI Equivalent)</u>

13.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? [ ] ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

YES NO N/A

13.2 Are all average RRFs > 0.050?

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements. [ ] ___ ___

13.3 Are response factors stable over the concentration range of the calibration. The % relative standard deviation (%RSD) 15.0% as per SW-846, 8260B-17 Sect. 7.3.6.2.

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 15.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

[ ] ___ ___

NOTE: Analytes previously qualified "U" due to blank

	YES	NO	N/A
contamination are still considered as "hits" when qualifying for calibration criteria.	[ ]	___	___
13.4 Was the % RSD determined using RRF or CF? If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.	___	[ ]	___
13.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.)			
ACTION: Circle errors with a red pencil.			
ACTION: If errors are large, take action as specified in section 3.2 above.			
14.0 GC/MS Calibration Verification (CLP Form VII Equivalent)	[ ]	___	___
14.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest?	[ ]	___	___
14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument?			
ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.			
ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").	[ ]	___	___
14.3 Was the % D determined from the calibration verification determined using RRF or CF? If no, what method was used			

YES NO N/A

to determine the calibration verification? Document any effects to the case in the Data Assessment.

___ [ ] ___

14.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2).

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements. ___ [ ] ___

14.5 Do any volatile compounds have a RRF < 0.05?

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, qualify all positive

YES NO N/A

results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements. ___ [ ] ___

14.6 Are there any transcription/calculation errors in the reporting of %D between initial and continuing RRFs/CFs? (Check at least two values but if errors are found, check more).

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 Internal Standards (CLP Form VIII Equivalent)

[ ] ___ ___

15.1 Are the internal standard areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)?

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Upper Limit

(Attach additional sheets if necessary.)

ACTION: 1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

2. Do not qualify non-detects when the

assoc
iated
IS
are
count
s
area

YES NO N/A

> + 100%.

3. If the IS area is below the lower limit (< - 50%), qualify all associated non-detects (U-values) "J".

4. If extremely low area counts are reported (< - 25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

15.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? [ ] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Field Duplicates [ ] ___ ___

16.1 Were any field duplicates submitted for volatile analysis?

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

DEFINITIONS

Acronyms:

BFB	-	bromofluorobenzene
BNA	-	base neutral acid
CCC	-	calibration check compound
CF	-	calibration factor
CLP	-	contract laboratory program
CRQL	-	contract required quantitation limit
% D	-	percent difference or percent drift
GC/MS	-	gas chromatography/mass spectroscopy
IS	-	internal standard
l	-	liter
LCS	-	laboratory control sample
Kg	-	kilograms
m	-	meter
mm	-	millimeter
MS	-	matrix spike
MSD	-	matrix spike duplicate
m/z	-	mass to charge ratio
QC	-	quality control
RIC	-	reconstructed ion chromatogram
RPD	-	relative percent difference
RRF	-	relative response factor
RRT	-	relative retention time
RSD	-	relative standard deviation
RT	-	retention time
SDG	-	sample delivery group
SOP	-	standard operating procedure
SPCC	-	system performance check compound
TIC	-	tentatively identified compound
TCLP	-	toxicity characteristic leach procedure
ug	-	micrograms
VOA	-	volatile organic acid

DEFINITIONS

Data Qualified Definitions:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.